

Invasion Ecology of Aquatic Animals

FAS 6932 (3 credits) Spring, 2022

CANVAS (online)

Course Description

A comprehensive overview of invasion ecology, highlighting aspects related to aquatic animals, including ecological concepts and debates underlying this developing field; biology and life history of nonnative aquatic animals, including characteristics of successful invaders; risk analysis methodology; and the conservation and regulatory implications of nonnative aquatic species.

Instructor

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Office hours: TUESDAYS 2-4 PM. Available by email or phone; office visits available by appointment. Note that the instructor is located about 2 hrs from main campus.

Graduate Teaching Assistant

TBD

Office hours: Available for meetings on campus or by email, Skype, or phone

Student Learning Outcomes

At the end of this course, each student will:

- understand the concepts associated with species invasions
- use basic risk assessment methodology
- think critically to evaluate literature and arguments, especially when faced with uncertainty and scientific disagreement
- more effectively communicate orally and in scientific writing
- appreciate for the complex relationship between science, management, and regulation

Course Meeting Times

Wednesday Periods 7-9 (1:55-4:55 pm); MCCD G001 / CANVAS

Required Readings

There is no required text for the course. Some important texts that I draw heavily upon for the course are listed as “Additional References,” below. Required readings will be provided in Canvas and will include the following papers which must be read by about the date specified below as they will be discussed in class and participation is expected.

*****Required Readings List Will be provided*****

Additional, supplemental readings will be provided in Canvas. These supplemental readings will be provided for each lecture topic and by invited speakers.

Class Format, Policies on Attendance and Make-up Exams

The course is a classroom-based, lecture and discussion format. For the online version, in-class lectures will be recorded each week and posted to Canvas where you can view them. No specific pre-requisites are required but the class is intended for advanced undergraduates. Given the broad scope of the field of invasion ecology, the course will cover diverse topics, each requiring a base of knowledge for the course to build upon. Students should have prior coursework in biology and understand basic ecological concepts.

Attendance records will not be maintained, but it is the responsibility of the student to maintain satisfactory progress in the course and to make up all work. Late project assignments will be penalized 10% on the first day and 5% on each subsequent day. Missed exams cannot be taken after the scheduled date without prior written consent of the instructor except under exceptional circumstances. Cases of serious illness, bereavement, or activities covered under the Twelve-Day Rule will be considered for make-up. Appropriate documentation must be provided in all cases.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

Students are expected to turn off all cell phones, messaging devices, or other communications devices during class unless specifically allowed by the instructor.

Assignments

Projects **MUST** be turned into CANVAS before midnight on the due date. There will be a penalty for late projects. Make prior arrangements and expect to turn projects in early if there are conflicts with the schedule.

- *Species Synopsis* – Students will write a brief species synopsis for a non-native aquatic species. The species will be chosen in consultation with the course instructor to prevent student overlap. A detailed outline of the project requirements will be provided during class. In brief, students will conduct literature and internet searches to obtain information on the occurrence, life history, ecology, effects, and regulatory status of the species and write a fact sheet summarizing this information and pointing out gaps in knowledge. The species synopses will be used in the Risk Assessment assignment.
- *Risk Assessment* – Students will participate in teams to conduct a risk assessment using the Federal Aquatic Nuisance Species Task Force RAM Committee Generic Analysis method or a risk screen using the Fish Invasiveness Screening Kit (FISK)/Aquatic Species Invasiveness Screening Kit (AS-ISK) or the U.S Fish and Wildlife Service Ecological Risk Screening Summary (ERSS) on a select species from the class species synopses. Teams will provide a copy of their completed risk assessment along with a short narrative explaining their methodology and results. More detailed information and requirements will be posted in Canvas.
- *Policy White Paper* – Graduate students will choose a policy, regulatory, or law-based topic related to non-native species and write a brief white paper on the subject. The topic must be approved by the instructor. The white paper can be position-based (e.g., pro or con) or simply informative.
- *Topic Review/Data Paper*— Graduate students have two options for this assignment— (1) a topic review or (2) a paper based on the analysis of a data set. Topics or data sets must be approved by the instructor. (Option 1) The student will choose an ecological topic pertinent to invasion ecology (e.g., relation of community diversity and invasibility) and write a detailed literature review of the subject. (Option 2) The student will provide a data set pertinent to invasion ecology, analyze the data, and write a short, data-based paper. This project will provide experience in finding and obtaining literature, assimilating and synthesizing technical information, and producing a detailed, written product. More detailed instructions will be provided during class.
- *Exams* – There will be two exams (a midterm and final). These will cover all information in lectures, readings, and from invited speakers. Species profiles and risk assessments (except what is covered in lecture), policy white papers, and topic reviews will not be covered on exams.

In-class and Online Discussions

This course includes text-based discussion threads in Canvas of the assigned readings or related topics. This forms the basis for the participation/discussion grade. **Students from all sections are required to participate.**

- Discussions will be each week except for Week 1. Week 1 has a discussion thread for class introductions; class introductions are not graded.
- Each student is required to post a minimum of three comments and/or replies per discussion.
- All discussions will be graded, and the top ten grades will be used to calculate the discussion grade for the semester. (i.e., the 10 best grades out of the 15 weeks).

Evaluation of Student Learning (Graduate Student)

10% *Species synopsis*
 10% *White paper*
 20% *Mid-Term exam*
 10% *Risk assessment*
 20% *Topic review/Data paper*
 20% *Final exam*
 10% *Discussion participation*

Grading Scale

A 94-100%; A- 90-93; B+ 86-89; B 83-85; B- 80-82; C+ 76-79; C 73-75; C- 70-72; D+ 66-69; D 63-65; D- 60-62; E <60%

<https://gradcatalog.ufl.edu/graduate/regulations/#text>

Schedule of Class Topics (subject to change)

WEEK	DATE	TOPIC	ASSIGNMENTS
1	Jan 5	Introduction/Pathways of Introduction	
2	Jan 12	Biogeography/Invasion Process	
3	Jan 19	Stages of Invasion Process	Policy White Paper Topic Due
4	Jan 26	Invasion Process Theory	
5	Feb 2	Impacts	Species Profile Due; Review/Data Set Topic Due
6	Feb 9	Impacts	
7	Feb 16	Case Studies	

8	Feb 23	Case Studies/Review	Policy White Paper Due
9	Mar 2	Risk Analysis/Risk Assessment	Mid-Term Exam
10	Mar 9	Spring Break—No Class	
11	March 16	Risk Assessment	
12	March 23	Risk Assessment Case Studies	
13	March 30	Management Techniques/Case Studies	Risk Assessments Due
14	April 6	International, Federal, and State Management and Policy	
15	April 13	Ecological Theory	Topic Reviews or Data Papers Due
16	April 20	Ecological Theory/Review	
	April 21-22		Reading Days
	April 28		Final Exam (Thursday 12:30-2:30 pm)

Additional References

Davis, M.A. 2009. *Invasion Biology*. Oxford University Press.

Elton, C.E. 1958. *The Ecology of Invasions by Animals and Plants*. Revised edition (2000). The University of Chicago Press.

Lockwood, J.L., M.F. Hoopes, and M.P. Marchetti. 2013. *Invasion Ecology*, 2nd Ed. Blackwell Publishing.

Williamson, M. 1996. *Biological Invasions*. Chapman & Hall.

Online Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

Other Information

Honor Pledge

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and

integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<https://sccr.dso.ufl.edu/students/student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Campus Helping Resources

- Contact information for the Counseling and Wellness Center: <https://counseling.ufl.edu/>, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.
- Career Resource Center, First Floor JWRU, 392-1601, www.crc.ufl.edu/

Students with Disabilities

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.